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LD<sub>50</sub> abbr. for median lethal dose.

LDH abbr. for L-lactate dehydrogenase (alternative to LD).

LDL abbr. for low-density lipoprotein.

LDL receptor a cell-surface receptor that binds apolipoprotein B and so internalizes low-density lipoprotein (LDL) from the plasma, leading to processing that regulates cholesterol and LDL synthesis, and thence plasma cholesterol concentration. It is a type I membrane protein. The number of LDL receptors on liver cells is regulated by cholesterol synthesis: when cholesterol levels rise, the number of receptors falls. Defects in this receptor are associated with certain forms of type II hyperlipidemia. The amino end of the extracellular domain contains seven or eight 40-residue repeats; each repeat has about six Cys residues, all of which are involved in disulfide bonds; following these repeats is a region of about 350 residues that is homologous with part of the epidermal growth factor precursor. Example (precursor) from human: database code LDLR\_HUMAN, 860 amino acids (95.27 kDa).

Le abbr. for Lewis antigen.

leaching (microbial) a process for the solubilization of metals, mostly from poor ores, by lithotrophic bacteria. See also lithotroph.

lead symbol Pb: a very soft, bluish-white metallic element of group 14 of the IUPAC periodic table. It has a low melting point and high relative density, proton number 82, relative atomic mass 207.2. It is commonly used for shielding from ionizing radiation.

leader peptidase EC 3.4.9.36; other name: signal peptidase I, phage-procoat-leader peptidase; an enzyme that catalyzes the cleavage of N-terminal leader sequences from secreted proteins.

leader peptide an alternative name for signal peptide.

leader sequence or lead sequence an alternative name for signal sequence (see signal peptide).

leading strand the DNA strand that is synthesized continuously, in the 5' to 3' direction, towards the replication fork during the discontinuous replication of duplex DNA. Compare lagging strand.

lead screw a threaded rod the rotation of which is used to drive the tool carriage of a lathe, the plunger of a syringe, etc. leaf (pl. leaves) 1 the principal organ of photosynthesis and transpiration in higher plants. It typically consists of a flattened blade-like lamina, often relatively broad, attached to the plant stem directly or by a stalk. 2 any thin, flattened object that resembles a leaf. See also leaflet.

leaflet 1 a small or young leaf (def. 1). 2 an individual segment of a compound leaf. 2 any small, thin, flattened object or structure that resembles the leaf of a plant, especially a lipid bilayer or a portion of a biological membrane.

leafy (in genetics) describing any mutation that fails to shut off completely the activity of a gene so that some residual expression of the gene remains.

Le antigen symbol for Lewis antigen.

least squares a statistical method for determining the 'best' value of an unknown quantity relating one or more sets of measurements or observations. It is based on minimizing the sum of the squares of the deviations of the experimentally determined values from the calculated values, and is used especially to find a curve that best fits a given set of data.

leaving group any atom or group, charged or uncharged, that departs during a substitution or displacement reaction from what is regarded as the residual or main part of the substrate of the reaction.

Lebedev-Saft or Lebedev juice an aqueous extract of air-dried yeast. It will ferment glycerol (dihydroxyacetone) and, in the presence of phosphate, produces a hexose phosphate. [After Alexander Nikolovich Lebedev (1881-1938), Russian botanist who described the preparation in 1911.]

Le Chatelier principle or Le Chatelier-Braun principle a principle stating that when a system in equilibrium is subject to stress, i.e. to a change in its conditions, the system will adjust

itself to annul, as far as possible, the effect of the stress. [First formulated (in 1885) by Henry (Louis) Le Chatelier (1850-1936), French chemist, and independently in 1886 by Karl Ferdinand Braun (1850-1918), German physicist.]

lecithin an old trivial name, still in frequent use, for any 3-sn-phosphatidylcholine.

lecithinase any of a number of distinct enzymes acting on lecithins that are now usually considered among the phospholipases.

lecithin-cholesterol acyl transferase abbr.: LCAT; EC 2.3.1.43; recommended name: phosphatidylcholine-sterol O-acyltransferase; other name: phospholipid-cholesterol acyltransferase. An enzyme that catalyzes a reaction between phosphatidylcholine and cholesterol to form a cholesteryl ester and 1-acylglycerophosphocholine. This enzyme is central to the extracellular metabolism of plasma lipoproteins; it acts on free cholesterol in the high-density lipoprotein (HDL) precursor, transferring a fatty acyl group to cholesterol, thus contributing to the altered class composition of the mature HDL; some of the resulting cholesterol esters are partly taken up by low-density lipoprotein. The enzyme is a glycoprotein, and is activated by apolipoprotein A.I. It is deficient in Norum and fish eye diseases. Example (precursor) from human: database code LCAT\_HUMAN, 440 amino acids (49.52 kDa).

lectin any of a group of specific agglutinins and other antibody-like (glyco)proteins of nonimmune origin, defined (by IUB) as 'sugar-binding protein or glycoprotein of non-immune origin which agglutinates cells and/or precipitates glycoconjugates'. Lectins are widely distributed in nature, being found mainly in seeds but also in other parts of certain plants, and in many other organisms from bacteria to mammals. Lectins bear at least two sugar-binding sites; they bind specific sugars and thereby precipitate certain polysaccharides, glycoproteins, and glycolipids, and/or agglutinate animal and plant cells. Some can distinguish between normal and malignant cells, and many, e.g. phytohemagglutinin, are mitogenic. They are widely used experimentally, especially concanavalin A, as tools in carbohydrate biochemistry, for studying cell surfaces and for inducing transformation (def. 3) of lymphocytes. Plant lectins are also known as phytoagglutinins.

LED abbr. for light-emitting diode.

Lederberg, Joshua (1912- ), US geneticist notable for his work on sex factors in bacteria and for discovering bacterial transduction; Nobel Laureate in Physiology or Medicine (1958) for his discoveries concerning genetic recombination and the organization of the genetic material of bacteria [prize shared with G. W. Beadle and E. L. Tatum].

leghemoglobin (or exp. Brit.) leghaemoglobin a hemoglobin-like red pigment found in the root nodules of leguminous plants. An autoxidizable hemoprotein, it sequesters dioxygen to prevent inhibition of nitrogenase in the bacteroids. It is thus essential for symbiotic nitrogen fixation. Example, leghemoglobin I (monomer) from pea: database code LGBI\_PEA, 147 amino acids (15.82 kDa).

legumain EC 3.4.22.34; other names: bean endopeptidase; vicilin peptidohydrolase; phaseolin; an endopeptidase from legumes that hydrolyzes Asn-I-Xaa bonds in small molecule substrates such as Boc-Asn-OPhNO<sub>2</sub>. Example (precursor) from *Phaseolus vulgaris*: database code CYPSP\_PHAVU, 362 amino acids (40.17 kDa).

legumin a major storage protein of the seeds of both leguminous and nonleguminous plants. It consists of two chains, an acidic  $\alpha$  chain and a basic  $\beta$  chain which are linked by a single disulfide bond. These are derived from a common precursor; example (precursor) from *Pisum sativum*: database code LEG2\_PEA, 520 amino acids (59.27 kDa). Residues 23-355 form the  $\alpha$  chain, and 336-520 the  $\beta$  chain.

Leigh theory a theory that enables the use of electron spin resonance data to estimate distances between two interacting spins embedded in a rigid lattice. [After J. S. Leigh.]

Leloir, Luis Federico (1906-87), Argentinian biochemist noted